REMARKS

After the foregoing amendment, claims 1-22, as amended, are pending in the application. Claims 1 and 14 have been amended to more particularly point out and distinctly claim the subject matter which Applicants regard as the invention The specification has been amended to correct a typographical error. Claims 19-22 are new. Applicants submit that no new matter has been added to the application by the Amendment.

Rejection - 35 U.S.C. § 102

The Examiner rejected claims 1-3 under 35 U.S.C. § 102 as being unpatentable over U.S. Patent No. 5,220,432 (Roe et al.). Applicants respectfully traverse the rejection.

Amended claim 1 recites, *inter alia,* An image-writing device ...comprising: a plurality of writing elements for writing the dots by illuminating the image-receiving body; a memory storing compensation parameters; and a driver for driving the writing elements according to said data by supplying the writing elements with energy modified according to the compensation parameters, wherein the compensation parameters give the dots substantially identical widths in a direction perpendicular to the screen angle.

It is known that the use of a plurality of writing elements in image writing devices to write dots on an image receiving body by illuminating the writing body with optical energy may give rise to dots of unequal size due to the variability of the intensity of light that the writing elements emit. It is also known in the art to equalize the energy of the light emitted from the plurality of writing elements in accordance with stored compensation parameters.

Depending on the arrangement of the writing device, the plurality of writing elements may also cause a kind of distortion of the dots that result in printing defects which is not able to be corrected by merely equalizing the energy of the light emitted from the plurality of writing elements, for example focusing the dots of light in a skewed manner. The aforementioned distortions are of particular concern if they are aligned with the screen angle of the dots. Accordingly, the present invention controls the energy provided to the writing elements with a type of compensation parameters, different from the known type of compensation parameters, to make the dots substantially identical in width in a direction perpendicular to the screen angle.

Roe et al. is directed to an apparatus for recording half-tone image separations at particular screen angles. A store 7 stores a number of maps, each defining an array of half-tone

dot areas and map typically having slightly different threshold values for printing the dots. Prior to exposing a recording medium, the store is loaded with a map in an orientation (screen angle) corresponding to the image to be printed. The recording medium is exposed by generating a binary beam of light from a laser in synchronism with scanning of the map, where the laser output is turned on and off by comparing an image signal with the current map value (threshold). The dot printed in each dot area is half-tone dot printed as explained in col. 3, lines 35-61.

Roe et al. teaches scanning each map in the same direction, regardless of the screen angle of the map. As described at col. 4, lines 13-31, scanning the maps in this manner gives rise to complications, because the borders of the map are not parallel to the axes of the reference axes. Roe et al. solves these complications by rearranging portions of the map such that the borders of the map are parallel to the reference axes (see col. 4, lines 32-50). Parameters M and N are used to characterize the intersection of the borders of the map with respectively, Y and X axes defining the direction of scanning.

The Examiner first states that Roe et al. teaches a memory storing compensation parameters for modifying dots so that the dots have substantially uniform width as viewed at the screen angle, citing col. 4, lines 32-38.

Applicants respectfully submit that the Examiner has misconstrued Roe et al. The parameters M and N, discussed at col. 4, lines 32-62 and illustrated in Figs. 3 and 4 of Roe et al. are merely integers which are used for characterizing the screen angle and are used only for rearranging the map such that borders of the map are parallel to the X and Y axes. There is no teaching or suggestion in Roe et al. of using the parameters M and N to modify the laser beam energy such that the recorded dots have substantially identical widths in a direction perpendicular to the screen angle, as recited in amended claim 1.

The Examiner also states that each dot written by Roe et al. will inherently have the same width as viewed at the screen angle when arranged into an L-shaped block. Applicant submits that the mere appearance of the dots as being identical in width is not the issue presented. Amended claim 1 recites a means for making the widths of dots identical for the situation in which the widths of dots vary because of defects in the writing mechanism. Accordingly, if as stated by the Examiner, all the dots would inherently have the same width as viewed at the screen angle when arranged in an L-shaped block, Roe et al. could not possibly be

teaching a means for making the width of the dots substantially identical by modifying the energy to the writing element, since there would be no need for doing same.

The Examiner, referencing col. 4, line 63 to col. 5, line 3, further states that the memory stores at least two sets of "compensation parameters" corresponding to different screen angles. However, it is clear from the specification as a whole that the reference to "change of shape" at col. 4, line 63 is to the shape of a map and not to the shape of individual dots. It is clear from the specification that the information stored in Roe et al's memory is not compensation data used to modify the energy provided to the writing elements, but rather the stored information is used to rearrange a map at an arbitrary angle with respect to the scanning axes such that its borders are parallel to the scanning axes.

Note also that in col. 5, line 13, Roe et al. specifies a binary beam control signal, thus writing to each location a dot of only one size or no dot at all. Accordingly, at no point in Roe et al. is it taught or suggested that the energy supplied to the writing element (laser) is modified, or in fact, capable of being modified, according to compensation data, as recited in amended claim 1.

Applicants submit that Roe et al. does not anticipate amended claim 1. Accordingly, for all the above reasons, Applicants respectfully request reconsideration and withdrawal of the §102 rejection of claim 1.

Further, it is respectfully submitted that since claim 1 has been shown to be allowable, claims 2-3 dependent on claim 1 are allowable, at least by their dependency. Accordingly, for all the above reasons, Applicants respectfully request reconsideration and withdrawal of the § 102 rejection of claims 2 and 3.

Rejection - 35 U.S.C. § 102

The Examiner rejected claim 14 under 35 U.S.C. § 102 as being unpatentable over U.S. Patent No. 5,436,644 (Motoi et al.). Applicants respectfully traverse the rejection.

Claim 14 states, *inter alia*, "A method of controlling an image-writing device having a plurality of light-emitting elements ...comprising the steps of: controlling energy supplied by the light-emitting elements so that the photosensitive body receives approximately identical illumination energy from all of the light-emitting elements; and further controlling the

energy supplied by the light-emitting elements so that said illuminated dots have approximately equal widths when viewed at the screen angle."

The Examiner states that Motoi et al. teaches at col. 16, lines 11-31, controlling the energy supplied by light-emitting elements so that the photosensitive body receives approximately identical illumination from all the light-emitting elements, resulting in:(1) dots of dimensions "a" and "b" and (2) the dots inherently having equal widths when viewed at a screen angle.

Applicants submit that the writings at col. 16, lines 11-31 merely disclose that the shape of the laser spot beam has a ratio of a to b, and that the ratio may vary by as much as 3:1, (see equation at line 19) resulting in a beam shape that may vary from quite oblate to nearly circular. Further, col. 16 discloses that the individual parameters a and b may vary individually by as much as 5:1 (equation at line 39). Accordingly, there is no teaching or suggestion in the writings at col. 16 that the photosensitive body receives approximately identical illumination energy from all of the light emitting elements.

Further, Motoi et al. discusses the dimensions of the laser beam spot and not the dimensions of the spot formed on the photosensitive body. The dimensions of the spot formed on the photosensitive body depend upon the time that the laser spot beam is left on as it is scanned, and therefore the dimensions of the spot formed on the photosensitive body differ from the laser spot beam dimensions. This is clearly illustrated in Figs. 6c, 8c, 25(d) and 36(i), which show examples of signals output by the modulating circuits (260, 260A, 260B and 260C) that control the laser beam on-time, and Figs 11 and 37, which show examples of different sizes formed by leaving the laser beam on for different times. In Fig. 37, for example, the middle dot is wider than the upper and lower dots.

As understood, each final printed toner dot may be made up of a plurality of smaller dots, each formed by exposure to one optical spot. In Motoi et al. this is expressed by saying that one looked pixel portion is composed of small pixels in the quantity mxn (col. 16, lines 59-61). Since the size of the individual small dots depends on the time that the laser is left on, the individual small dots may have different sizes. The claimed invention gives the individual small dots equal widths in the direction perpendicular to the screen angle. Motoi et al. teaches away from the claimed invention by teaching that the laser beam is left on for different times for different dots.

While Motoi et al. discloses feeding back a signal corresponding to an amount of light from the semiconductor array at col. 23, lines 62-66, the fed back signal corresponds to the amount of light, (i.e. intensity) and not to illumination energy. Further, Motoi et al. fails to teach or suggest controlling the light energy supplied by the light emitting elements so that the illuminated dots on the photosensitive body have approximately equal widths when viewed at the screen angle.

Applicants submit that Motoi et al. does not teach or suggest controlling the energy supplied to the light-emitting elements so that the photosensitive body receives approximately equal energy from all the light emitting elements and the illuminated dots have approximately equal widths when viewed at the screen angle.

Rejection - 35 U.S.C. § 103

The Examiner rejected claim 15 under 35 U.S.C. § 103 as being unpatentable over Motoi et al. and further in view of Roe et al. The Examiner states that Motoi et al. does not teach the use of different compensation parameters for different screen angles but that Roe et al. teaches a memory having at least two sets of compensation parameters corresponding to different screen angles. The Examiner states it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the teachings of Motoi et al. by providing an L shaped map with different compensation parameters for different screen angles as taught by Roe et al. Applicants respectfully traverse the rejection.

Claim 15, dependent on allowable claim 14 recites, controlling the energy supplied by the light emitting elements using different compensation parameters for different screen angles. As discussed above, the parameters described by Roe et al. are used for rearranging the map and not for the purpose of controlling the energy supplied by the light emitting elements. Since the parameters disclosed by Roe et al. do not control the energy supplied by the light emitting elements, the teachings of Roe et al. do not overcome the deficiency of Motoi et al. Accordingly, Applicants respectfully request reconsideration and withdrawal of the § 103 rejection of claim 15.

Claims 4, 5 and 16

The Examiner objected to claims 4, 5 dependent on claim 1, and claim 16 dependent on claim 14, as being dependent upon a rejected base claim. Amended claims 1 and

14 have been shown to be allowable. Accordingly, claims 4, 5 and 16 are allowable, at least by being dependent on claims 1 and 14. Accordingly, Applicants respectfully request reconsideration and withdrawal of the objection to claims 4, 5 and 16.

Conclusion

Insofar as the Examiner's objections and rejections have been fully addressed, the instant application, including claims 1-18, is in condition for allowance and Notice of Allowability of claims 1-18 is therefore earnestly solicited.

Respectfully submitted,

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(Date)

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